AMENDMENT

In the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application. Currently amended claims are shown with additions underlined and deletions in ~~strikethrough~~ text. No new matter is added by these amendments.

1.-43. (Canceled)

44. (Currently amended) An apparatus, comprising:

a user object including an elongated portion;

a closed-loop five member linkage coupled to the user object and configured to enable the user object to move in a first rotary degree of freedom, a second rotary degree of freedom, and in a translational degree of freedom, the close-loop five member linkage including a serial-linked chain of a ground member, a first extension member, a first central member, a second central member and a second extension member, the first and second central members being coupled to the user object respectively via a first object coupling and a second object coupling such that the first and second central members are substantially non-parallel with respect to the elongated portion of the user object, the first central member being fixedly coupled to the first object coupling, the second central member being fixedly coupled to the second object coupling; and

at least one sensor coupled to the closed-loop five member linkage and operative to detect a movement of the user object in at least one degree of freedom.

45. (Previously presented) An apparatus according to claim 44, wherein the user object includes a grip portion and an elongated portion.

46. (Previously presented) An apparatus according to claim 45, wherein the grip portion further includes a first member and a second member, the first and second members movable relative to one another to simulate a cutting blade of a medical instrument.

47. (Previously presented) An apparatus according to claim 46, further comprising a transducer coupled to the grip portion of the user object, the transducer responsive to a relative motion of the first and second members.

48. (Previously presented) An apparatus according to claim 45, wherein the grip portion includes a finger wheel.

49. (Previously presented) An apparatus according to claim 45, further comprising a barrier disposed between the grip portion and the closed-loop five member linkage.

50. (Previously presented) An apparatus according to claim 45, further comprising a trocar disposed between the grip portion and the closed-loop five member linkage.

51.-56. (Canceled)

57. (Currently amended) An apparatus, comprising:

a user object including a grip portion and an elongated portion, the user object being configured to represent a laparoscopic surgical instrument;

a closed-loop five member linkage coupled to the user object and configured to enable the user object to move in a first rotary degree of freedom, a second rotary degree of freedom, and in a translational degree of freedom, the close-loop five member linkage including a serial-linked chain of a ground member, a first extension member, a first central member, a second central member and a second extension member, the first and second central members being coupled to the user object respectively via a first object coupling and a second object coupling such that the first and second central members are substantially non-parallel with respect to the

elongated portion of the user object, the first central member being fixedly coupled to the first object coupling, the second central member being fixedly coupled to the second object coupling;

at least one sensor coupled to the closed-loop five member linkage and operative to detect a movement of the user object in at least one degree of freedom, the detection of the at least one sensor associated with the movement of the user object being input to a laparoscopic surgical simulation; and

at least one actuator coupled to the closed-loop five member linkage and configured to output a feedback force, the feedback force being correlated with the laparoscopic surgical simulation.

58. (Previously presented) An apparatus according to claim 57, further comprising at least one capstan mechanism coupled to the at least one actuator and the closed-loop five member linkage.

59. (Previously presented) An apparatus according to claim 57, wherein the at least one actuator includes a plurality of actuators, each actuator being associated with one of the first and second rotational degrees of freedom and the translational degree of freedom.

60.-63. (Canceled)

64. (Previously presented) An apparatus according to claim 44, wherein the use object is representative of one of a laparoscopic instrument, an endoscopic instrument, a catheter, a hypodermic needle, a fiber optic bundle, a joystick, a screw driver, and a pool cue.

65. (Previously presented) An apparatus according to claim 44, wherein the detection of the at least one sensor associated with the movement of the user object is input to a virtual reality simulation.

66. (Previously presented) An apparatus according to claim 65, wherein the virtual reality simulation includes a medical procedure.

67. (Previously presented) An apparatus according to claim 65, wherein the feedback force is correlated with the virtual reality simulation.

68. (Previously presented) An apparatus according to claim 44, further comprising at least one capstan drive mechanism coupled to the at least one actuator and to the closed-loop five member linkage, the at least one capstan mechanism configured to facilitate a transmission of the feedback force from the at least one actuator to the closed-loop five member linkage.

69. (Previously presented) An apparatus according to claim 68, wherein the at least one capstan mechanism includes an assembly of a capstan drum, a one cable, and a pulley.

70. (Previously presented) An apparatus according to claim 44, wherein the at least one actuator includes a motor.

71. (Previously presented) An apparatus according to claim 44, wherein the at least one actuator includes a braking mechanism.

72. (Previously presented) An apparatus according to claim 57, wherein the grip portion further includes a first member and a second member movable relative to one another, configured to simulate a cutting blade in the laparoscopic surgical instrument.

73. (Previously presented) An apparatus according to claim 72, further comprising a transducer coupled to the grip portion, the transducer responsive to a relative motion of the first and second members.

74. (Previously presented) An apparatus according to claim 57, further comprising a barrier disposed between the grip portion and the closed-loop five member linkage.

75. (Previously presented) An apparatus according to claim 57, further comprising a trocar disposed between the grip portion and the closed-loop five member linkage.

76. (Previously presented) An apparatus according to claim 57, wherein the at least one actuator includes one of a motor and a braking mechanism.